

CLAIMS:

1. An absorbent material consisting of a molecular network of starch molecules, the starch molecules comprising at least 90% (w/w) amylopectin.

2. The absorbent material of claim 1, wherein the molecular network 5 comprises self-entangled starch.

3. The absorbent material of claim 1, wherein the molecular network comprises cross-linked starch.

4. The absorbent material of claims 2 and 3, wherein said absorbent material is in particulate form.

10 5. The absorbent material of claim 4, wherein said particulate form comprises particles ranging in size from 89 to 589 microns.

6. The absorbent material of claim 5, having a centrifuge retention capacity of at least 10 g/g and a free swell capacity of at least 13 g/g.

15 7. The absorbent material of claims 2 and 3, wherein the molecular network is produced from a waxy starch.

8. The absorbent material of claim 7, wherein said waxy starch is selected from the group consisting of waxy maize starch, waxy wheat starch, waxy rice starch, waxy sorghum starch, waxy potato starch, waxy cassava starch, waxy barley starch and mixture thereof.

20 9. The absorbent material of claim 8, wherein said waxy starch is waxy maize starch.

10. The absorbent material of claim 3, wherein said cross-linked starch is cross-linked with a cross-linker selected from the group consisting of sodium

trimetaphosphate, sodium tripolyphosphate, phosphorous oxychloride, phosphoryl chloride, epichlorohydrin, divinyl sulfone, ethylene glycol diglycidyl ether, chlorohydrin, bromohydrin, N,N'-Methylenebisacrylamide, alkylenebisacrylamides, diepoxyalkanes, diglycidyl ethers, glyoxal, glutaraldehyde, dialdehydes, activated polyethylene glycols, and mixture thereof.

5 11. The absorbent material of claim 10, wherein the cross-linker is selected from the group consisting of phosphorous oxychloride, sodium trimetaphosphate, sodium tripolyphosphate and mixtures thereof.

12. The absorbent material of claim 11, wherein the cross-linker is sodium trimetaphosphate.

10 13. A process for producing an absorbent material as defined in claim 2, comprising the steps of:

- (a) mixing a starch comprising at least 90% amylopectin with water to produce a paste;
- (b) feeding the paste into an extruder to produce an extrudate;
- (c) aging the extrudate; and
- (d) grinding the extrudate.

14. A process for producing an absorbent material as defined in claim 3, comprising the steps of:

- (a) mixing a starch comprising at least 90 % amylopectin with water, an alkali and a cross-linking agent to produce a paste
- (b) feeding the paste into an extruder to produce an extrudate;
- (c) aging the extrudate; and
- (d) grinding the extrudate.

20 15. A process as defined in claim 14, the paste comprising from 0.001 to 2.0% (w/w) of the crosslinking agent.

25 16. A process as defined in claim 14, the paste comprising from 0.001 to 2.0% (w/w) of the alkali.

17. A process as defined in claims 13 and 14, the starch-based paste having a moisture content ranging from 25 % to 45 %.

18. A process, as defined in claim 15, wherein the cross-linking agent is being selected from the group consisting of sodium trimetaphosphate, sodium tripolyphosphate, phosphoryl oxychloride, phosphorous chloride, epichlorohydrin, divinyl sulfone, chlorohydrin, bromohydrin, N,N'-Methylenebisacrylamide, alkylenebisacrylamides, ethylene glycol diglycidyl ether, diepoxyalkanes, diglycidyl ethers, glyoxal, glutaraldehyde, dialdehydes, activated polyethylene glycols and mixtures thereof.

19. A process as defined in claim 18, wherein the cross-linking agent is being selected from the group consisting of sodium trimetaphosphate, sodium tripolyphosphates and phosphorous oxychloride.

20. A process as defined in claim 19, wherein the cross-linking agent is sodium trimetaphosphate.

21. A process as defined in claim 16, wherein the alkali is being selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, magnesium hydroxide, calcium hydroxide, beryllium hydroxide, ammonium hydroxide, sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, sodium acetate, potassium acetate, sodium phosphate, sodium hydrogenophosphate, potassium phosphate, potassium hydrogenophosphate and mixtures thereof.

20 22. A process, as defined in claim 18, wherein the alkali is sodium hydroxide.

23. A process as defined in claims 13 and 14, wherein the extrudate has a temperature of at least 130°C.

25 24. A process as defined in claim 23 wherein the extrudate is aged at least 48 hours at a temperature of at least 50°C.

25. A process as defined in claims 13 and 14, wherein the grinding produces a particulate material comprising particles ranging in size from 89 µm to 589 µm.

26. An absorbent mixture comprising:

- 5 a) an absorbent material as defined in claim 1; and
- b) a co-absorbent material.

27. An absorbent mixture as defined in claim 26, wherein the absorbent material comprises particles ranging in size from 89 to 589 microns.

28. An absorbent mixture as defined in claim 27, wherein the co-absorbent material is selected from the group consisting of synthetic superabsorbent polymers, mannose containing polysaccharides, ionic polysaccharides, fibers and mixtures thereof.

15 29. An absorbent mixture as defined in claim 28, wherein the synthetic superabsorbent polymers are obtained by polymerization of monomers selected from the group consisting of acrylic acid, acrylate salts, acrylic ester, acrylic anhydride, methacrylic acid, methacrylate salts, methacrylic esters, methacrylic anhydride, maleic anhydride, maleic salts, maleate esters, acrylamide, acrylonitrile, vinyl alcohol, vinyl pyrrolidone, vinyl acetate, vinyl guanidine, aspartic acid, aspartic salts and mixtures thereof.

20 30. An absorbent mixture as defined in claim 28, wherein the mannose containing polysaccharides are selected from the group consisting of guar gum, tara gum, locust bean gum, konjac, mesquite gum, psyllium extracts, fenugreek extracts and mixtures thereof.

31. An absorbent mixture as defined in claim 28, wherein the ionic polysaccharides comprise anionic and cationic polysaccharides.

25 32. An absorbent mixture as defined in claim 31, wherein the anionic polysaccharides are selected from the group consisting of carboxyalkyl polysaccharides, oxidized polysaccharides, sulphated polysaccharides, polysaccharides half-esters,

carboxymethyl cellulose, carboxymethyl starch, xanthan, carrageenans, pectin and mixtures thereof.

33. An absorbent mixture as defined in claim 28, wherein the fibers are selected from the group consisting of cellulose, viscose, rayon, cellulose acetate, NylonTM,
5 polyalkylenes, polyethylene, polypropylene, bi-component fibers, polyesters, polylactides, polypropanediols, LyocellTM, sphagnum and mixtures thereof.

34. Use of the absorbent mixture of claim 27 in the manufacture of an absorbent product for absorbing liquids selected from the group consisting of aqueous solutions, water, physiological solutions and saline solutions.

10 35. The use as defined in claim 34, wherein the absorbent product is selected from the group consisting of diapers, incontinence articles, sanitary napkins, water-storing materials, absorbent paper products, surgical absorbents, pet litter, bandages, wound dressings and food absorbent pads.